by Schneider Electric

INSTALLATION

Endura®
NET5400T Series
Video Encoder

C4658M-C (6/10)

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Important Notices

LEGAL NOTICE

SOME PELCO EQUIPMENT CONTAINS, AND THE SOFTWARE ENABLES, AUDIO/VISUAL AND RECORDING CAPABILITIES, THE IMPROPER USE OF WHICH MAY SUBJECT YOU TO CIVIL AND CRIMINAL PENALTIES. APPLICABLE LAWS REGARDING THE USE OF SUCH CAPABILITIES VARY BETWEEN JURISDICTIONS AND MAY REQUIRE, AMONG OTHER THINGS, EXPRESS WRITTEN CONSENT FROM RECORDED SUBJECTS. YOU ARE SOLELY RESPONSIBLE FOR INSURING STRICT COMPLIANCE WITH SUCH LAWS AND FOR STRICT ADHERENCE TO ANY/ALL RIGHTS OF PRIVACY AND PERSONALTY. USE OF THIS EQUIPMENT AND/OR SOFTWARE FOR ILLEGAL SURVEILLANCE OR MONITORING SHALL BE DEEMED UNAUTHORIZED USE IN VIOLATION OF THE END USER SOFTWARE AGREEMENT AND RESULT IN THE IMMEDIATE TERMINATION OF YOUR LICENSE RIGHTS THEREUNDER.

REGULATORY NOTICES

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: “How to Identify and Resolve Radio-TV Interference Problems.” This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission’s rules.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Video Quality Caution

FRAME RATE NOTICE REGARDING USER-SELECTED OPTIONS

Pelco systems are capable of providing high quality video for both live viewing and playback. However, the systems can be used in lower quality modes, which can degrade picture quality, to allow for a slower rate of data transfer and to reduce the amount of video data stored. The picture quality can be degraded by either lowering the resolution, reducing the picture rate, or both. A picture degraded by having a reduced resolution may result in an image that is less clear or even indiscernible. A picture degraded by reducing the picture rate has fewer frames per second, which can result in images that appear to jump or move more quickly than normal during playback. Lower frame rates may result in a key event not being recorded by the system.

Judgment as to the suitability of the products for users' purposes is solely the users' responsibility. Users shall determine the suitability of the products for their own intended application, picture rate and picture quality. In the event users intend to use the video for evidentiary purposes in a judicial proceeding or otherwise, users should consult with their attorney regarding any particular requirements for such use.

Description

The NET5400T Series video encoder is a network-based multichannel encoder with a built-in, Web-based viewer for live streaming to a standard Web browser (Microsoft® Internet Explorer® or Mozilla® Firefox®). The encoder features open architecture connectivity and is also part of an Endura® system to record, manage, configure, and view multiple live streams.

The encoder supports up to three compression formats and many resolutions for each video channel. Standard compression formats include H.264 and JPEG. Dual streams can be configured to a variety of resolutions, frame rates, and bit rates for each attached camera.

The encoder includes 1-, 2, and 4-channel units, and some models support a full line of video analytics for object detection and activity detection. The 1-channel models include built-in support for the Power over Ethernet (PoE) standard, 802.3af, while the 2-channel models include built-in support for the PoE+ standard 802.3at. This technology supplies power to the encoder through the network. If PoE is not available, the encoder is prewired for 12 or 24 VAC, and can be powered from an optional external power supply or directly from an optional rack mount.

The main function of the NET5400T Series encoder is to convert analog NTSC or PAL video into standard definition digital H.264 video and JPEG video streams. It transmits these streams over an Ethernet network to other Endura system components. These streams can be recorded on an Endura Endura NSM5200 network storage manager or other Endura storage, or they can be decoded by the following Endura components:

- **NET5402R-HD video decoder:** Converts up to 32 video streams for display.
- **WS5200 software:** Displays up to 32 video streams on a computer monitor or on the WS5070 Endura workstation.
- **VCD5200 video console display:** Converts up to 32 video streams (depending on model) for display.

The NET5400T Series incorporates EnduraView™ video optimization technology to select the best image quality and frame rate for the target Endura product (decoder, workstation, or console), all without affecting the system recording rate. For example, the unit selects a high rate and quality setting for recording and automatically selects a lower rate for viewing in a multiple view format.

The NET5400T can be configured for one alarm input for each video channel and provides one relay output for the unit. When an alarm event is triggered, the unit can send a message to an operator, trigger a relay, and start recording video.

The unit also supports activity detection for each video channel. You can configure up to three activity zones, each with its own independent sensitivity and threshold settings. When the NET5400T detects activity in any of these areas, it can trigger an alarm event.

The video encoder supports one audio input for each video channel over the network. The system operator (security personnel) can see and hear activity in any target area in which a microphone is present.

The NET5400T supports control of remote peripherals such as pan/tilt/zoom (PTZ) cameras by way of Pelco D and Coaxitron® protocols.

FEATURES

- Open standards-based architecture
- H.264 baseline, main, or high profile compression
- Dual-stream at up to 4CIF, 30/25 images per second (ips) per stream
- Integrated multizone video motion detection
- Integrated audio, alarm, and relay outputs
- Integrated Coaxitron and Pelco D PTZ protocols
- Support for Power over Ethernet (PoE or PoE+) on the 1- and 2-channel models
- Support for multicast transmissions

MODELS

NET5401T	One-channel H.264 encoder with Camera Sabotage
NET5401T-OS	One-channel H.264 encoder with OV Security Suite
NET5401T-OSP	One-channel H.264 encoder with OV Security Suite Plus
NET5401T-OCP	One-channel H.264 encoder with OV Event Counting Security Suite
NET5401T-I	One-channel H.264 encoder with built-in Pelco Analytics Suite
NET5402T	Two-channel H.264 encoder with Camera Sabotage
NET5402T-OS	Two-channel H.264 encoder with OV Security Suite
NET5402T-OSP	Two-channel H.264 encoder with OV Security Suite Plus
NET5402T-OCP	Two-channel H.264 encoder with OV Event Counting Analytics Suite
NET5402T-I	Two-channel H.264 encoder with built-in Pelco Analytics Suite
NET5404T	Four-channel H.264 encoder with Camera Sabotage
NET5404T-OS	Four-channel H.264 encoder with OV Security Suite
NET5404T-OSP	Four-channel H.264 encoder with OV Security Suite Plus
NET5404T-OCP	Four-channel H.264 encoder with OV Event Counting Security Suite
NET5404T-I	Four-channel H.264 encoder with built-in Pelco Analytics Suite

SUPPLIED ACCESSORIES

Mating Connectors	4-pin power connector for external power supply (not supplied); 16-pin terminal block for alarms, relays, and PTZ devices

OPTIONAL ACCESSORIES

RK5200PS-5U	Rack mount with two power supplies (12 units)
WM5200-4U	Wall mount for single unit without power supply
NET5400PS	Power supply for all models when not installed in the RK5200PS-5U

Before You Begin

Endura is a network system that requires a continuous amount of bandwidth to transmit true, live video; therefore, always include your network administrator when planning and installing Endura components.

You will also need the following items:

- Pelco-approved Endura certification
- Access to an Endura network
  - that is an active, Gigabit Ethernet network that supports the full Internet Protocol suite,
  - that is configured with at least one Endura system manager, and
  - that is configured with at least one Endura workstation.

NOTES:

- Endura components are designed to deliver high-quality, high-frame rate video across a network. For best results, make sure your installation meets the power, environmental, and networking guidelines described in the Installation Guidelines for Endura equipment document, which is available on the Endura partner portal.
- When using one or more network switches on the Endura network, enable autonegotiation on all switches.
- These network requirements represent the minimum standard for a small Endura-capable security network. Consult the Endura 2.0 Network Design Guide to make sure your network is properly configured. Your system may be different and may require additional hardware, software, and network resources.

USER-SUPPLIED PARTS

In addition to the standard tools and cables required for a video security installation, you will need to provide the following items:

Qty	Description
1	Cat5e (or better) cable and connectors for connecting the unit to the Endura network or Cat6 cable for connecting up to four NET5400T units in a daisy chain
1	Power supply; refer to *Connecting Power* on page 33 for more information
1	Analog video device (fixed or PTZ camera)
1	Monitor, if using looping video
1	Small flat-tip screwdriver, if connecting camera control, relay, or alarms

You also need to provide all network equipment, such as switches, for the Endura network.

PACKAGE CONTENTS

The following diagram shows the box contents. When installing the unit, refer to this diagram.

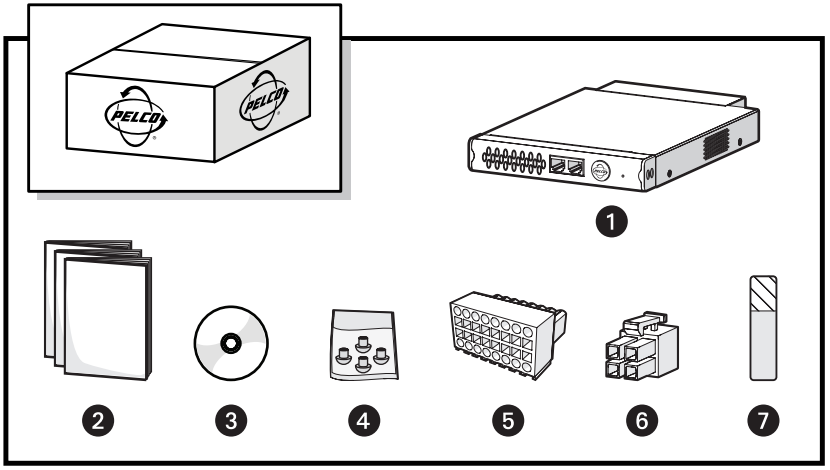

Figure 1. Package Contents

1. NET5400T Series Video Encoder
2. Installation Manual, Safety Instructions, and Quick Start Guide (1 ea.)
3. Resource Disc
4. Rubber Feet (4 ea.)
5. 16-Pin Terminal Block (1 ea.)
6. 4-pin Terminal Block (1 ea.)
7. Pelco Badge Rotation Sticker (1 ea.)

NOTE: Since power requirements vary by installation, the NET5400T Series does not include an individual power supply. You can purchase either the optional NET5400PS single-unit power supply or the RK5200PS-5U rack mount, which includes two power supplies. Refer to *Connecting Power* on page 33 for more information on supplying power to the unit.

PRODUCT SERIAL NUMBER LABEL PLACEMENT

Product serial number labels help Pelco's Product Support identify your system and its factory configuration in case the unit or its components require service.

A label citing your product's serial number is attached to the bottom panel of the unit. Because rack mounting or other installation options may obscure the factory-applied label, two additional labels are provided. Attach one of them to your product documentation or another product location that will not be obscured by installation. The second label is a spare.

To use these labels:

1. On the bottom panel of your unit, locate two small labels, attached with a yellow sticker that reads, "Extra serial number labels: remove prior to installation."
2. Remove the yellow sticker and the labels.
3. Peel away the backing from one label and attach it to this installation manual, other product documentation, or an unobscured product location.

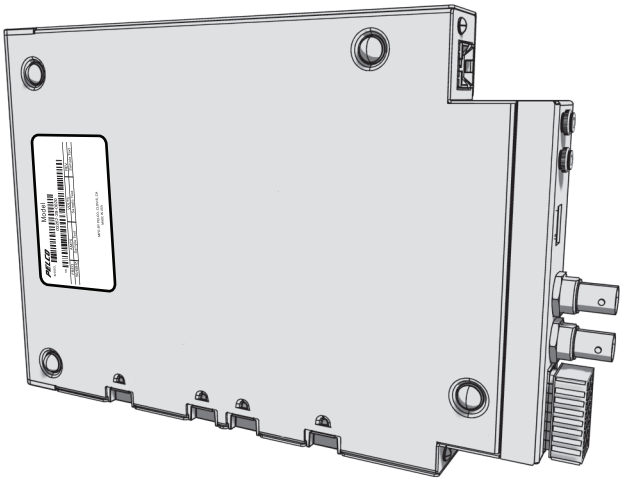

Figure 2. Product Serial Number Label Placement

Equipment Placement and Rack Mounting

Use one of the following installation methods for the unit:

- Place the unit on a flat surface, such as a shelf or desktop.
- Mount the unit to a wall using the optional WM5002-4U wall mount kit.
- Install the unit in the optional RK5200PS-5U rack mount kit.

NOTES:

- Each installation method, except the RK5200PS-5U, requires the installation of a separate power supply, either the NET5400PS (not supplied) or other equipment supplied by the user (refer to *Connecting Power* on page 33).
- When installing the unit on a desktop, use the rubber feet provided with the unit to protect the desktop from surface damage. The rubber feet are not needed when mounting the unit in a wall or rack mount.

DESKTOP INSTALLATION

To place the unit on a flat surface, such as a desktop:

1. Attach the rubber feet to the bottom of the unit to prevent surface damage.

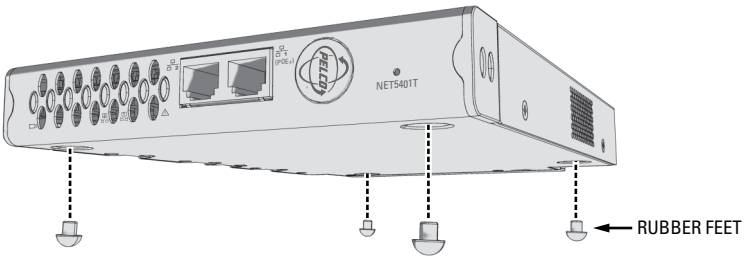

Figure 3. Attaching Rubber Feet for Desktop Placement

2. Position the unit to allow for cable and power cord clearance at the front and rear panels.

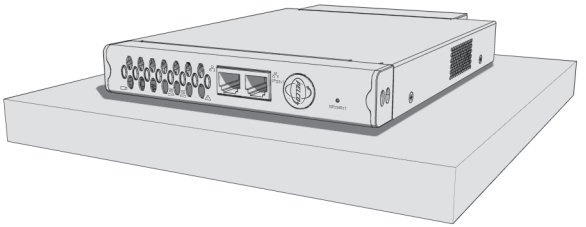

Figure 4. Desktop Placement

⚠ **WARNING:** Do not place the unit unit on its side; the unit could fall over and cause damage. Placing the unit on its side also blocks air flow and can cause the unit to overheat.

WALL MOUNTING

A single NET5400T Series unit can be mounted to a wall using the optional WM5002-4U wall mount system.

To mount the unit to a wall using the WM5002-4U:

1. Install the WM5002-4U; refer to the WM5000 Series Wall Mount Kit Installation manual.
2. Insert the NET5400T Series unit into the wall mount. Make sure all front and rear panel connectors are accessible.

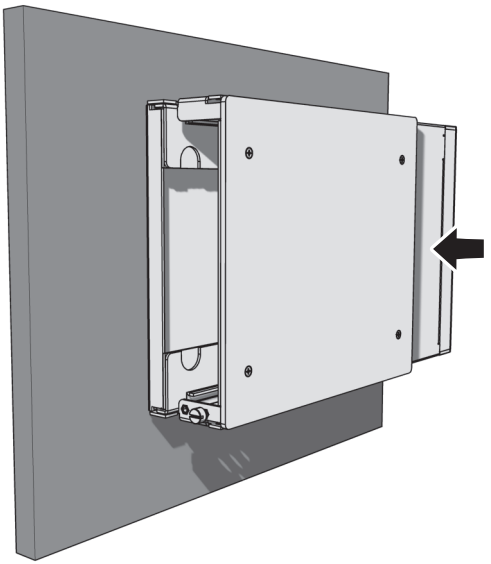

Figure 5. NET5400T and WM5002-4U Wall Mount

3. Tighten the thumbscrew on the wall mount to secure the unit.

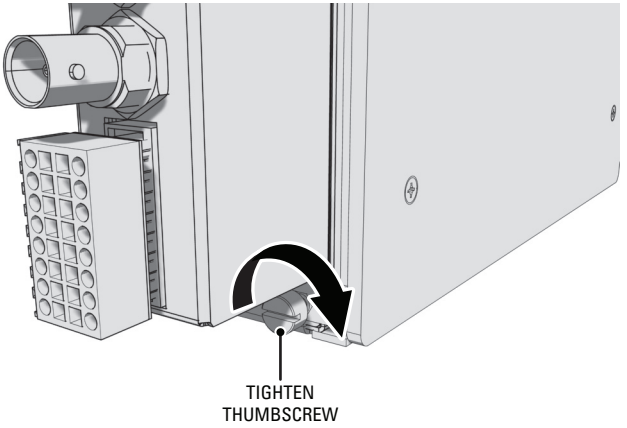

Figure 6. Tighten the Thumbscrew to Secure the Unit

RACK MOUNTING

The optional RK5200PS-5U rack mount kit can support up to 12 NET5400T Series units. Each unit connects directly to a power connector in the rack and is powered by the rack.

NOTES:

- To ensure proper rack ventilation, install a blank module (RK5001B-5U) in each empty slot.
- The RK5200PS-5U supplies only power. It does not provide a dock for any other unit connectors.
- Always leave at least 1 rack unit (RU) of space below the RK5200PS-5U unit. If another unit is installed directly above an RK5200PS-5U, only the lower unit needs an empty rack space below it.

To install the unit into a rack mount kit:

1. Install the RK5200PS-5U rack mount kit into the rack; refer to the RK5200PS-5U Rack Mount Chassis Installation manual.
2. Insert the unit into the desired slot.

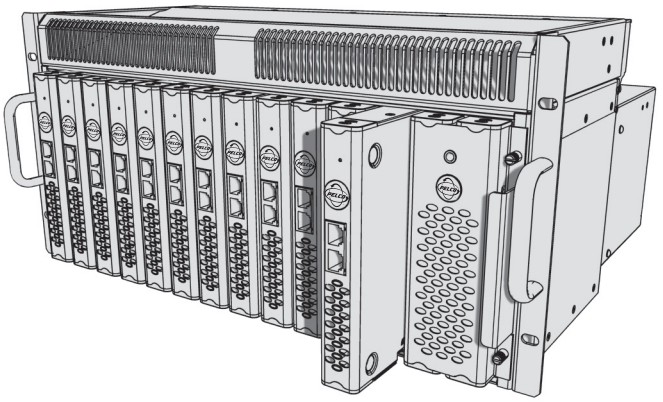

Figure 7. Multiple Units in an RK5200PS-5U

3. Tighten the thumbscrew on the rack mount to secure the unit into the rack.

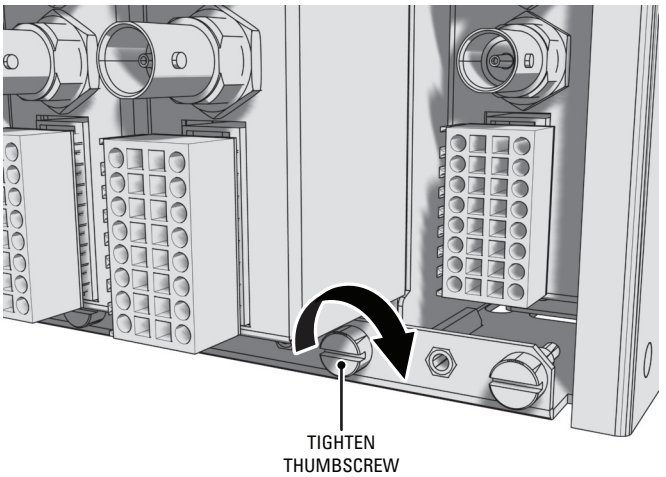

Figure 8. Tighten Thumbscrew to Secure the Unit

PELCO BADGE ORIENTATION

The Pelco badge on the front panel of the unit can be rotated in quarter turns. If you install the unit on a flat surface, the Pelco badge will be turned the wrong way.

To rotate the Pelco badge:

1. Use the Pelco badge rotation sticker that came with the unit.
2. Attach the middle portion of the rotation sticker to the badge.
3. Press firmly with your thumb and rotate the badge to its correct position.
4. Remove the rotation sticker from the badge.

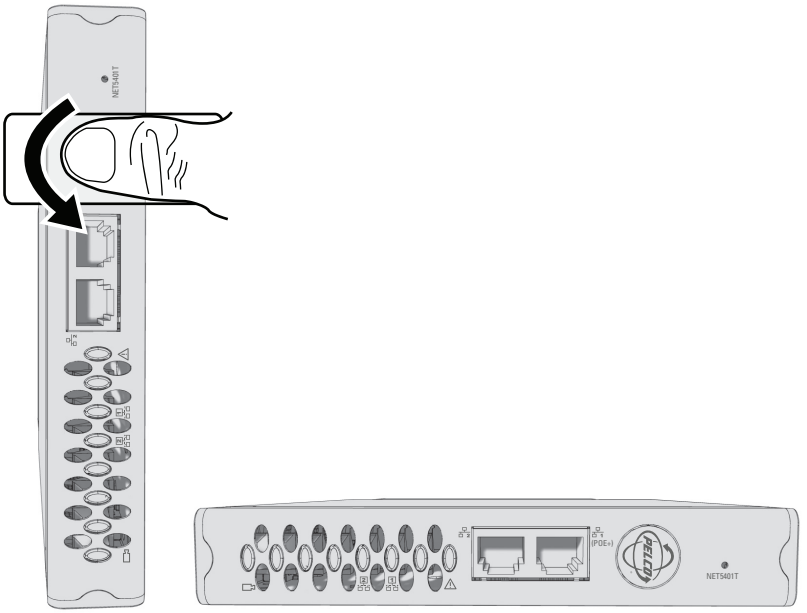

Figure 9. Pelco Badge Orientation

Connections

4-CHANNEL MODELS

Familiarize yourself with the rear panel before connecting any equipment to the unit. Refer to *Connecting a PTZ Device, Relay, and Alarms* on page 24 for a description of the terminal block connections.

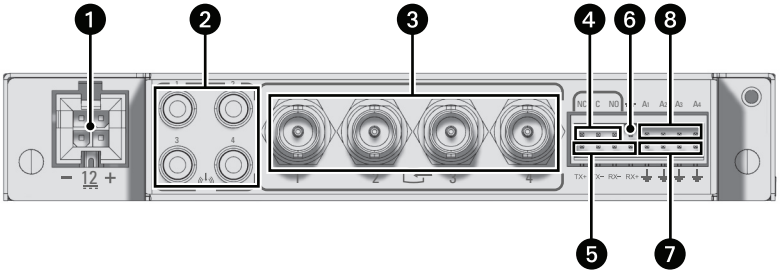

Figure 10. Rear Panel for 4-Channel Models

1. 4-Pin Power
2. Audio In 1 through 4
3. Video In 1 through 4
4. Relay Connections
5. RS-422 PTZ Connections
6. Ground
7. Ground
8. Alarm Connections

2-CHANNEL MODELS

Familiarize yourself with the rear panel before connecting any equipment to the unit. Refer to *Connecting a PTZ Device, Relay, and Alarms* on page 24 for a description of the terminal block connections.

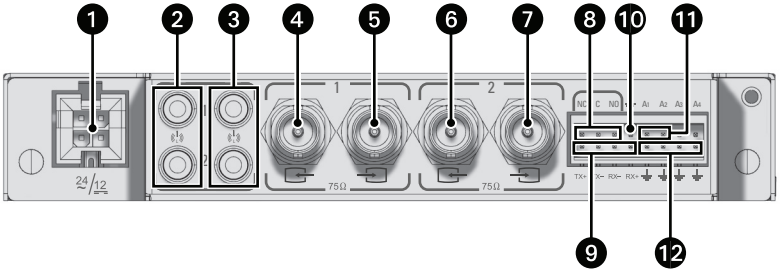

Figure 11. Rear Panel for 2-Channel Models

1. 4-Pin Power
2. Audio Out 1 and 2
3. Audio In 1 and 2
4. Video In 1
5. Video Out 1
6. Video In 2
7. Video Out 2
8. Relay Connections
9. RS-422 PTZ Connections
10. Ground
11. Alarm Connections
12. Ground

1-CHANNEL MODELS

Familiarize yourself with the rear panel before connecting any equipment to the unit. Refer to *Connecting a PTZ Device, Relay, and Alarms* on page 24 for a description of the terminal block connections.

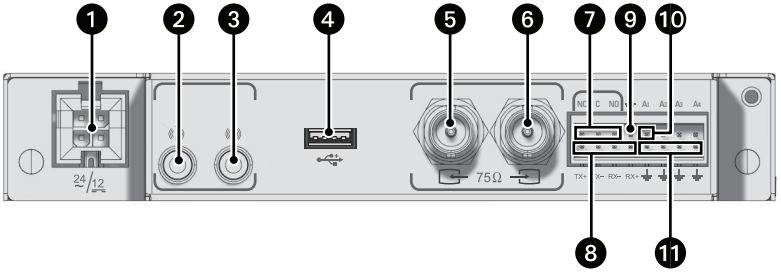

Figure 12. Rear Panel for 1-Channel Models

1. 4-Pin Power
2. Audio Out
3. Audio In
4. USB (Reserved)
5. Video In
6. Video Out (Looping)
7. Relay Connections
8. RS-422 PTZ Connections
9. Ground
10. Alarm Connections
11. Ground

CONNECTING VIDEO INPUT AND OUTPUT DEVICES

The NET5400T Series offers both analog video input and looping video output (available on the 1-channel models).

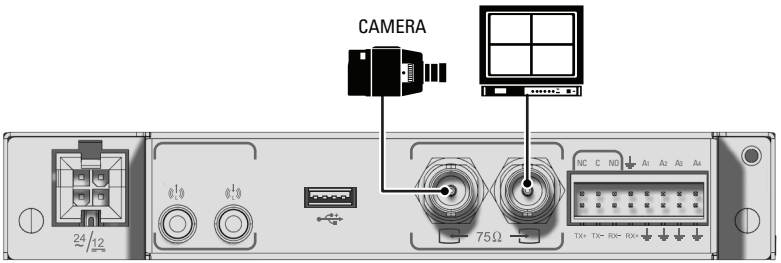

Figure 13. Video Input and Output

Before installing the unit, make sure the distance from the unit to the video device is less than the maximum distance for the coaxial cable. Refer to Table A for maximum video coaxial cable distances.

Table A. Video Coaxial Cable Requirements

Cable Type*	Maximum Distance
RG59/U	750 ft (229 m)
RG6/U	1,000 ft (305 m)
RG11/U	1,500 ft (457 m)

*Cable requirements:
75-ohm impedance
All-copper center conductor; steel-center conductor cable may result in poor performance
All-copper braided shield with 95 percent braid coverage

CONNECTING VIDEO INPUT

The NET5400T Series automatically detects the video standard (PAL or NTSC) and accepts both color and black-white analog video.

To connect video input:

1. Connect a coaxial cable to the camera or other analog video source.
2. Connect the coaxial cable to the video in connector on the rear panel.
3. If not using looping video, you must set the video termination for the camera. Video termination can be set from the WS5200 advanced system management software.

The unit supports Coaxitron up-the-coax operation to a PTZ device. When the unit receives a camera control command, it transmits that command up the coaxial cable to the PTZ device. Since Coaxitron is a single-direction protocol, the PTZ device cannot return any data to the unit. By default, Coaxitron is disabled.

This unit also supports a serial PTZ device that uses the Pelco D protocol, such as the Spectra® dome. Connect the coaxial cable from the device, and then refer to *Connecting a PTZ Device (Pelco D)* on page 25 to connect the camera control leads.

CONNECTING LOOPING VIDEO

The NET5400T Series supports looping video on the 1- and 2-channel models. It passes the video input to a monitor or other analog video device.

To use looping video:

1. Connect a coaxial cable to the video out connector on the rear panel of a 1-channel model.
2. Connect the other end of the coaxial cable to the analog device.

CONNECTING AUDIO

The NET5400T Series supports one audio line input for an amplified audio input device. The unit encodes audio and video signals simultaneously. This lets you listen to activity in the target area.

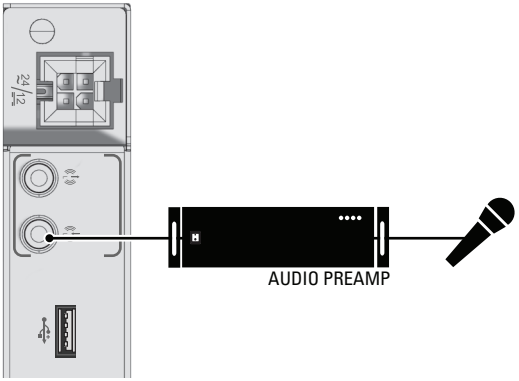

Figure 14. Audio Connections

To connect an audio input device:

1. Wire the input audio connector. Connect the signal high lead to the connector tip. Connect the common lead to the connector sleeve. The line input level is 1 Vp-p (0 dBV) nominal, 1.228 Vp-p (+4 dBU) maximum.

2. Connect a line input device to the blue 3.5 mm audio input monaural connector.

NOTES:

- Audio output is not supported at this time.
- Improper use of audio/visual recording equipment may subject you to civil and criminal penalties, Applicable laws regarding the use of such capabilities vary between jurisdictions and may require, amongh other things, express written consent from teh recorded subjects. You are solely responsible for insuring strict compliance with such laws and for strict adherence to any/all rights of privacy and personalty.

CONNECTING A PTZ DEVICE, RELAY, AND ALARMS

The NET5400T Series incorporates a 16-pin terminal block to support the following items:

- PTZ device, such as a dome camera, using the Pelco D protocol (RS-422)
- Relay control, either normally open (N.O.) or normally closed (N.C.)
- Up to four alarm inputs, supervised or unsupervised, using any combination of high and low signals

The terminal block has tension clamps instead of screw terminals. Use a small screwdriver to open the clamp for a particular lead. Figure 15 shows how to wire the terminal block and connect it to the unit.

NOTE: The terminal block is keyed. It attaches only one way to the video encoder.

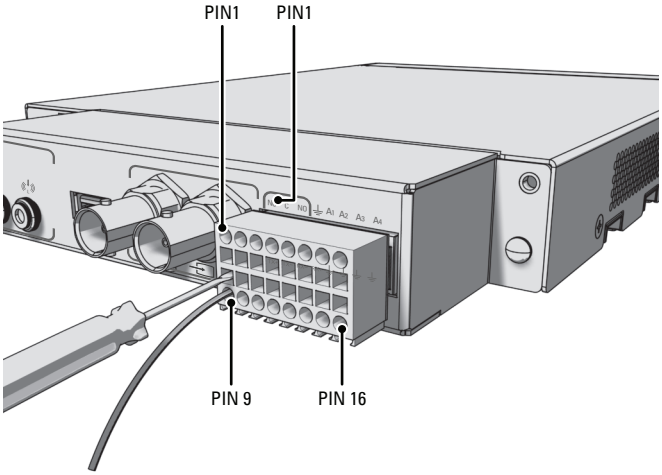

Figure 15. Terminal Block Connections

Table B identifies the pin assignments for the terminal block. An arrow on the rear panel identifies pin 1; on the terminal block, pin 1 is the left-most lead on the top row (refer to Figure 15).

Table B. PTZ, Relay, and Alarm Pin Assignments

Top Row		
Pin	**Label**	**Lead**
1	NC	Relay Normally Closed
2	C	Relay Common
3	NO	Relay Normally Open
4	⏚	Ground
5	A1	Alarm 1
6	A2	Alarm 2
7	A3	Alarm 3
8	A4	Alarm 4

Bottom Row		
Pin	**Label**	**Lead**
9	TX+	RS-422 Data TX+
10	TX–	RS-422 Data TX–
11	RX–	RS-422 Data RX–
12	RX+	RS-422 Data RX+
13	⏚	Ground
14	⏚	Ground
15	⏚	Ground
16	⏚	Ground

CONNECTING A PTZ DEVICE (PELCO D)

NOTE: To connect a Coaxitron PTZ device, refer to *Connecting Video Input* on page 22**.**

The NET5400T Series supports serial camera control using Pelco D (RS-422) for a PTZ device. You can connect only one serial PTZ device to a video encoder. The default Pelco D device address is 1.

When the unit receives a camera control command, it transmits that command to the PTZ device. In 4-wire installations, the encoder also receives data from the PTZ device, including camera status and alarm states. It then transmits that data to the command center.

Figure 16 shows how to wire the unit to a Spectra dome (refer to Table B for the specific connector pin assignments).

NOTE: When connecting a PTZ device to the unit, connect the TX+ and TX– leads to the RX+ and RX– leads between the encoder and the PTZ device.

By default, the encoder identifies any PTZ device as a fixed camera. You must configure the encoder before you can use the PTZ device; refer to the software configuration/operation manual.

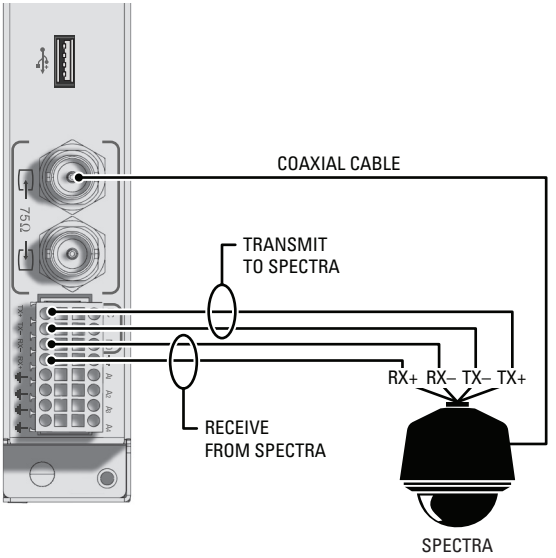

Figure 16. Connecting a Spectra Dome

Refer to Table C when installing the PTZ device. It lists the serial port settings that the unit supports.

Table C. Serial Port Options and Defaults

Setting	Options	Default
Data rate (bits per second)	2400, 4800, 9600, 38400, 115200	2400
Data bits	5, 6, 7, 8	8
Parity	None, Odd, Even	None
Stop bits	1, 2	1

NOTE: When using 115200 as the data rate, the following additional settings are used: the Data Bit is set to 8, Parity is set to No Flow Control, and the stop bit is 1.

CONNECTING A RELAY DEVICE

The NET4500T has an output for triggering an external device. It supports both momentary and continuous relay operation.

You can operate the relay interactively, during an active connection, or automatically to coincide with certain events. Typical applications include activating a door, gate or lock, or switching on lights or other electrical devices.

⚠ **WARNING:** Do not exceed the maximum rating of 30 VDC, 1 A.

Figure 17 shows how to wire the relay with its power source to the video encoder (refer to Table B on page 25 for the specific connector pin assignments).

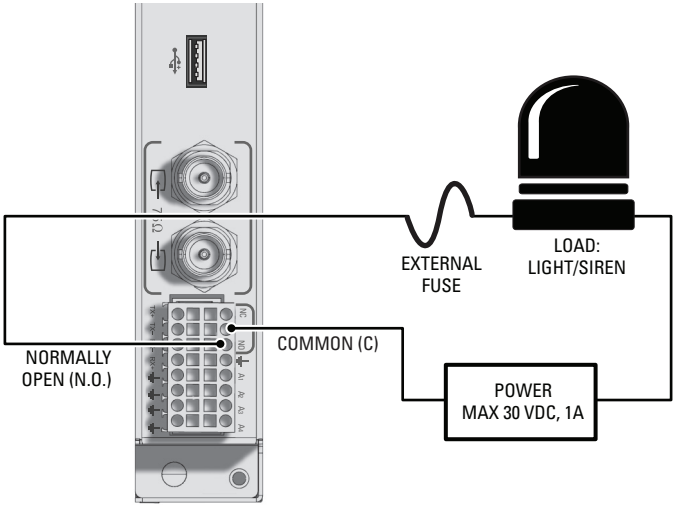

Figure 17. Connecting a Relay Device

CONNECTING ALARMS

The NET5400T Series offers three alarm inputs for external signaling devices, such as door contacts or motion detectors. Each encoder supports both normally open and normally closed devices. Each encoder also supports both supervised and unsupervised alarms.

Once configured, an alarm input can invoke many different activities, including triggering a relay device, sending an alert to a security office, changing the video recording settings, and storing pre-alarm video to an Endura video recorder. You can connect switches or contacts directly to the unit without a separate power supply.

Supervised Alarms

When an alarm is configured as a supervised alarm, the unit maintains a constant electrical current through the alarm circuit (3.3 VDC, 1 kohm). If the alarm circuit length changes, due to an electrical short or a bypass, the voltage fluctuates from its normal state; therefore, the unit triggers an alarm.

NOTE: Install the 10 kohm resistor as close to the switch as possible.

Figure 18 illustrates the alarm and no alarm conditions of a supervised alarm input. Whether the alarm is normally closed or normally open, neither a cut nor a bypass can defeat these alarms.

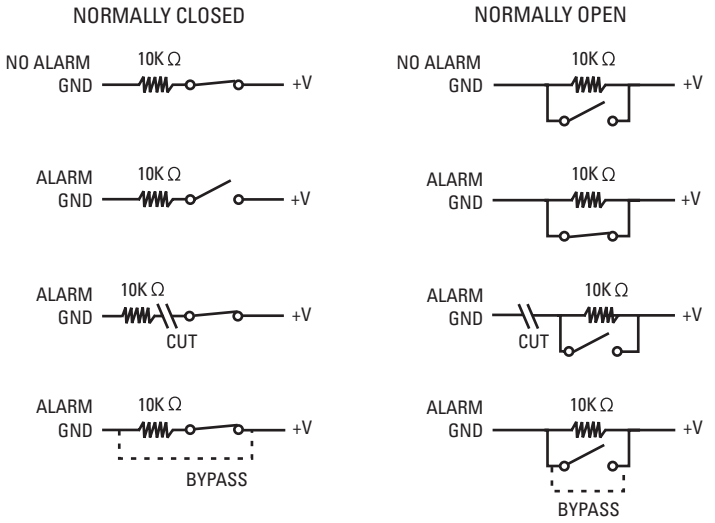

Figure 18. Supervised Alarm Conditions

Figure 19 illustrates the wiring configuration for supervised alarm inputs.

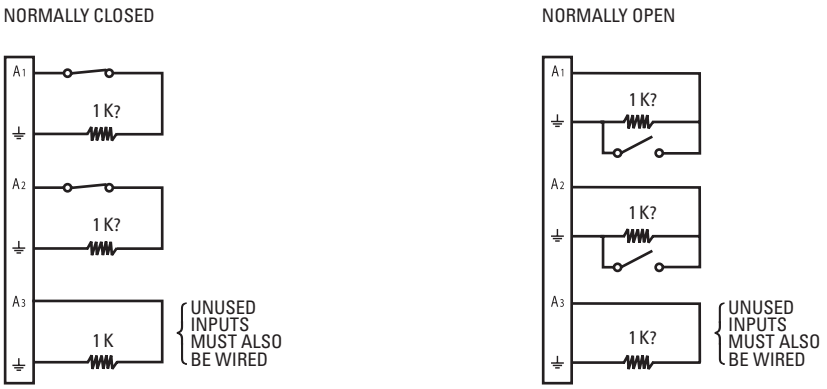

Figure 19. Supervised Alarm Input Wiring

Unsupervised Alarms

When an alarm is configured as an unsupervised alarm, the unit only triggers an alarm when the normal alarm state (open or closed) changes.

Figure 20 illustrates the alarm and no alarm conditions of an unsupervised alarm input. A normally closed alarm input can be defeated with a bypass. A normally open input can be defeated with a cut.

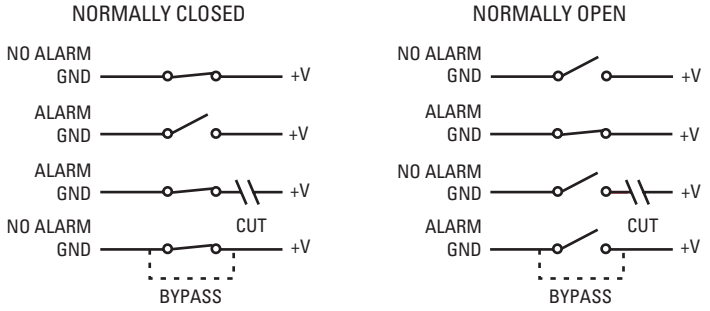

Figure 20. Unsupervised Alarm Conditions

Figure 21 illustrates the wiring configuration for unsupervised alarm inputs.

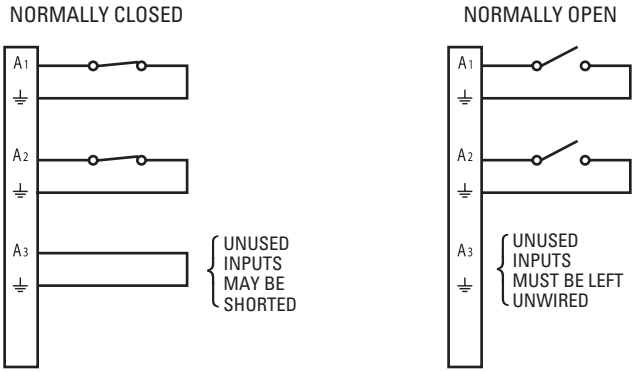

Figure 21. Unsupervised Alarm Input Wiring

Alarm Connections

Figure 22 shows how to wire the video encoder to an alarm (refer to Table B on page 25 for the specific connector pin assignments).

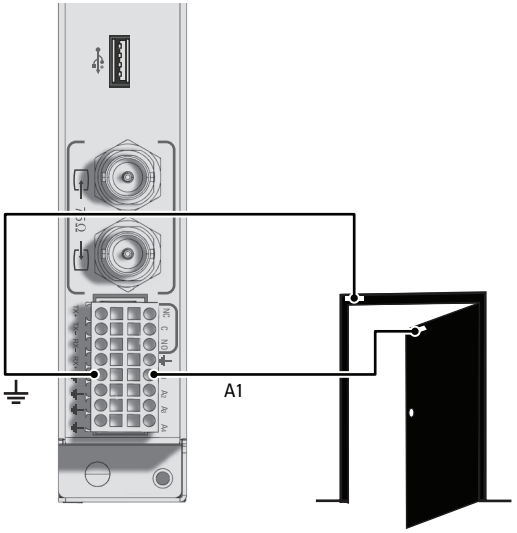

Figure 22. Connecting Alarms

CONNECTING TO THE NETWORK

Connect the video encoder to the Endura network:

1. Connect a Cat5e (or better) cable to either network port on the front panel.

   NOTE: If you are using a PoE or PoE+ , no other Cat5e is required. Using both network ports creates a video loop in the network. Do not use both network ports unless you intend to loop the video.

2. Connect the other end of the network cable to a 100/1000Base-T (or better) port on the Endura network switch.

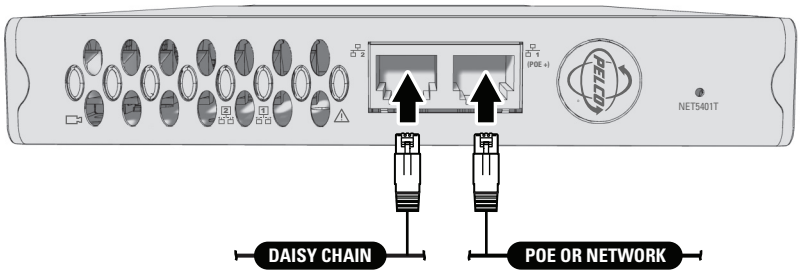

Figure 23. Connecting to the Endura Network

After you apply power to the encoder (refer to *Connecting Power* on page 33), the encoder automatically searches the Endura network for other Endura components. Also, the indicators on the front panel show network connection speed and status (refer to *Front Panel Indicators* on page 35).

NOTE: The 1- and 2-channel models support PoE and PoE+ respectively. Be sure to use the network port located at the right when using PoE or PoE+.

DAISY-CHAINING SEVERAL UNITS

A maximum of four NET5400T Series units can be connected together in a daisy-chained network. Follow these guidelines when setting up the daisy chain:

- Always use Cat6 cable with strain relief included at each connector.
- Always follow the cable length guidelines established by the Institute of Electrical and Electronics Engineers (IEEE).
- Use a Gigabit network connection for the unit that is connected to the network.

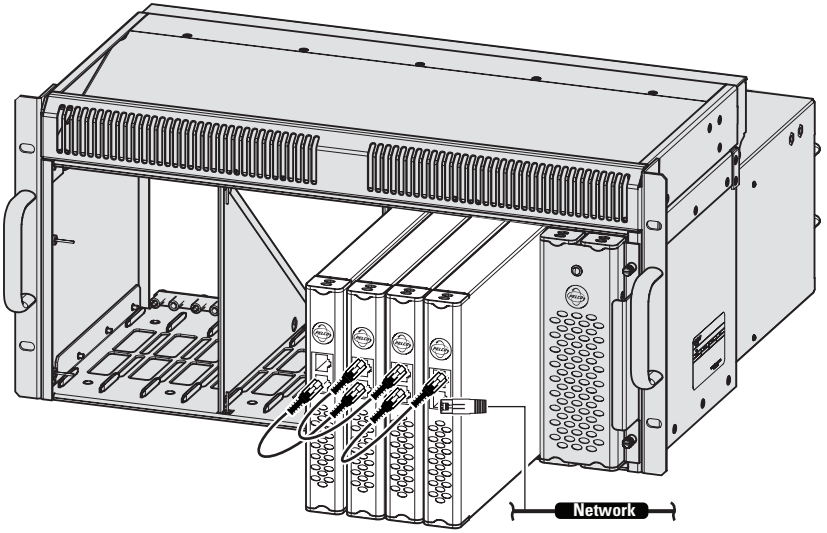

Figure 24. Daisy-Chained Units Installed in a Rack

CONNECTING POWER

This product is intended to be supplied with power by a 12 VDC (except for the NET5404T), 24 VAC, or a PoE power supply that is UL Listed, Class 2, or a UL Listed ITE power supply marked LPS, such as Pelco's NET5200PS or RK5200PS-5U. One- and two-channel models can operate from the PoE port.

The unit can be powered from the following sources:

- NET5400PS power supply connects directly to the 4-pin connector on the rear panel of the unit.
- The RK5200PS-5U rack mount kit supplies power through the 4-pin connector on the rear panel of the unit as soon as it slides into place.
- The 1-channel models support PoE, IEEE 802.3af-2003 (the network port located closest to the Pelco badge).
- The 2-channel models support PoE+, IEEE 802.3at (the network port located closest to the Pelco badge).

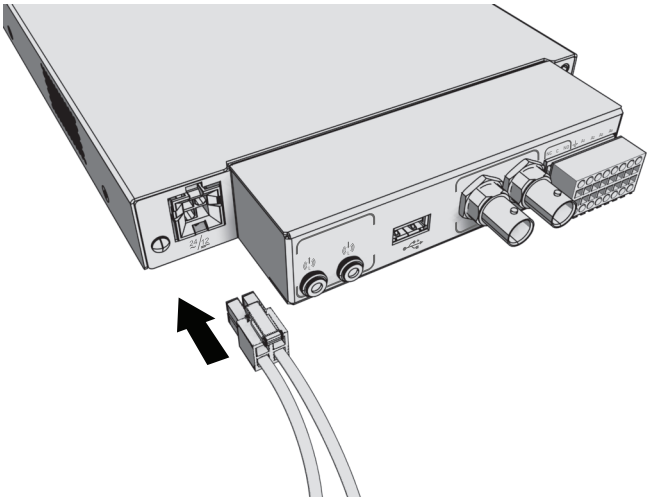

Figure 25. Connecting Power

POWER CONSUMPTION

Use Table D to help you determine the maximum power consumption for each model. Power consumption of the NET5400T Series varies depending on the number of video channels and the connected power supply.

Table D. Power Consumption Differences

Model Types	12 VDC External Power	24 VAC External Power	12 VDC Power from the RK5200PS-5U
1-channel models	15 W (52 BTU/h)	15 W (52 BTU/h)	75 W (256 BTU/h)
2-channel models	17.5 W (60 BTU/h)	17.5 W (60 BTU/h)	75 W (256 BTU/h)
4-channel models	27.5 W (94 BTU/h)	Not available	70 W (239 BTU/h)

NOTE: Power consumption rates are higher on the RK5200PS-5U because the rack power supports multiple units, cooling fans, backplane board, and auxiliary devices such as relays and alarms.

Table E. PoE Power Consumption Differences

Model Types	Type of PoE	Consumption
1-channel models	PoE	12 W (41 BTU/h)
2-channel models	PoE+	14 W (48 BTU/h)
4-channel models	Not available	

RECOMMENDED WIRE GAUGE AND WIRING DISTANCES

Use Table to help identify the necessary wire gauge and maximum cable distance. This table applies to 2-conductor solid copper wire. (Reduce distance by 10 percent for stranded copper wire.) These maximum distances are based on a maximum allowable voltage drop of 10 percent.

Table F. Recommended Wire Gauge and Maximum Wiring Distances

Wire Gauge	Maximum Distance	
	12 VDC	24 VAC
20 AWG (0.5 mm^2)	89 ft (27 m)	356 ft (108 m)
18 AWG (1.0 mm^2)	141 ft (42 m)	566 ft (172 m)
16 AWG (1.5 mm^2)	224 ft (68 m)	899 ft (274 m)
14 AWG (2.5 mm^2)	357 ft (108 m)	1,428 ft (435 m)
12 AWG (4.0 mm^2)	566 ft (172 m)	2,267 ft (690 m)
10 AWG (6.0 mm^2)	900 ft (274 m)	3,600 ft (1,097 m)

Connect power to the unit. The Pelco badge (blue) and the status light (green) on the front panel should glow.

FRONT PANEL INDICATORS

Refer to the NET5400T Series Configuration manual for details on setting up any camera that is attached to the unit. You can also view video from cameras attached to the unit from the WS5200 software or from the VCD5200 video console display.

4-CHANNEL MODELS

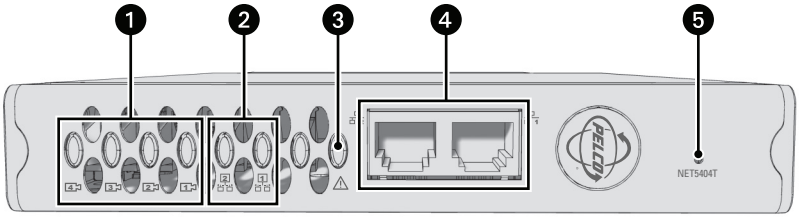

Figure 26. Front Panel Indicators on 4-Channel Models

1. Video Presence
2. Network Status
3. Unit Status
4. RJ-45 Network Ports
5. Reserved

2-CHANNEL MODELS

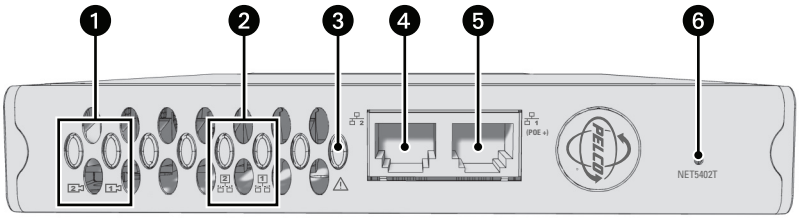

Figure 27. Front Panel Indicators on 2-Channel Models

1. Video Presence
2. Network Status
3. Unit Status
4. RJ-45 Network Port
5. PoE+ Network Port
6. Reserved

NOTE: The PoE+ network connector also accepts a standard RJ-45 network line.

1-CHANNEL MODELS

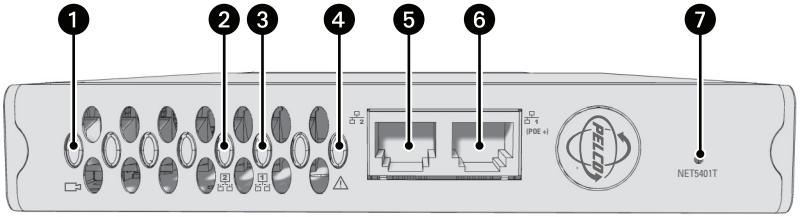

Figure 28. Front Panel Indicators on 1-Channel Models

1. Video Presence
2. Network Status, Line 2
3. Network Status, Line 1
4. Unit Status
5. RJ-45 Network Port
6. PoE Network Port
7. Reserved

NOTE: The PoE network port also accepts a standard RJ-45 network line.

DESCRIPTIONS OF THE FRONT PANEL INDICATORS

Video presence

Video presence is indicated by one of the following conditions:

- **Not Lit:** A camera has not been connected yet.
- **Green:** Camera video is present at the video in connector.
- **Red:** Video is no longer present; the camera is not functioning properly.

Network status

Network status (connection and speed) is indicated by one of the following conditions:

- **Off:** The unit is not connected to the network.
- **Solid amber:** The unit is connected to the network using the 100 Mbps standard.
- **Solid red:** The unit is connected to the network using the 10 Mbps standard.
- **Solid green:** The unit is connected to the network using the 1 Gbps standard.

NOTES:

- A blinking light indicates network activity corresponding to the speed based on the color.
- The NET5400T Series video encoder always uses the 100/1000Base-T standard. If the network status light is red, contact your network administrator or Endura-certified technician.

Pelco badge (power)

The Pelco badge glows blue when the unit has power.

Unit status

Unit status is indicated by one of the following colors:

- **Green:** The unit is functioning normally.
- **Red:** The unit is in an error condition.

Troubleshooting

If the following instructions fail to solve your problem, contact Pelco Product Support at 1-800-289-9100 (USA and Canada) or 1-559-292-1981 (international) for assistance.

Access the properties windows for the NET5400T Series video encoder on the Endura workstation; refer to the Endura WS5200 Advanced System Management Software Operation manual.

- **Unit serial number:** Located on the Properties window and on the product label
- **Unit firmware version:** Located on the Advanced Properties window, listed for the Encoder Device

NOTE: Do not try to repair the unit yourself. Opening it immediately voids any warranty. Leave maintenance and repairs to qualified technical personnel. Exchange the defective unit and return it for repair.

Table G. Troubleshooting the NET5400T Series Video Encoder *(1 of 2)*

Problem	Possible Causes	Suggested Remedy
Front panel indicators not lit	Power turned off	Check the power supply
Network connection	Faulty network connections	Visually inspect all network cables and connectors at the unit and the network switch
		Check the indicators on the network switch
	Unit has connected at 100Base-T	Contact your network administrator or Endura-certified technician
	Other network connectivity issues	Contact your network administrator or Endura-certified technician
	Incorrect cable type is used	Always use Cat5e or better cable; if more than one unit is connected to another in a daisy-chained network, always use Cat6 cable
No video transmission	Faulty cable connections	Check all leads, plugs, contacts, and connections
	Defective camera	Connect local monitor and check camera function
	Defective encoder	Check camera on a different encoder
No looping video on local monitor	Faulty cable connections	Check all leads, plugs, contacts, and connections

Table G. Troubleshooting the NET5400T Series Video Encoder *(2 of 2)*

No audio transmission to receiver	Volume set too low at receiver	Adjust volume control at receiver
	Audio service not enabled	Enable the audio service on the camera setup screen; refer to the software configuration/operation manual
	Faulty cable connection	Check all leads, plugs, contacts, and connections
	Defective audio devices or connections	Troubleshoot all connected audio devices
		Connect different audio hardware and check audio function
	Defective encoder	Check audio devices on a different encoder
Cannot control PTZ cameras or other devices	Camera protocol setting does not match encoder protocol setting	Change the protocol setting for the camera on the Endura workstation
		Change the camera to the correct protocol setting
	Other PTZ settings are not correct	Change the camera settings on the Endura workstation
	Faulty camera control cable connections	Check all cable connections; make sure all plugs are properly connected
The unit is not ready for operation after firmware upload	Voltage failure during programming of update file	Replace the device and have it checked by Pelco

Specifications

SYSTEM

Operating System	Linux®
User Interface	Remote operation from WS5070, WS5200 software, or VCD5200; Web-based remote operation is also available

VIDEO/AUDIO

Video Standards	NTSC/PAL/EIA/CCIR composite	
Video Coding	H.264 high, medium, or low profiles	
Video Streams	2 independently configurable video streams for each channel; 2 unicast streams for each channel	
Video Resolutions	NTSC	PAL
4CIF	704 x 480	704 x 576
2CIF	704 x 240	704 x 288
CIF	352 x 240	352 x 288
Video Inputs/Connector Type	1, 2, or 4 BNC inputs; Hi-Z/75 ohms impedance	
Video Looping	1-channel models only	
Audio Encoding	G.711 speech codec	
Audio Bit Rate	64 kbps	
Audio Levels	1 Vp-p (0 dBV) nominal, 1.228 V-p-p (+4 dBU) maximum, 10 kohms	
Audio Connectors	1, 3.5 mm monaural	
Connector Tip	Signal high (input)	
Connector Sleeve	Common	
Audio Input	Line in	

PTZ CONTROL

PTZ Interface	RS-422, video in
PTZ Protocols	Pelco D (RS-422), Coaxitron

ALARMS/RELAYS

Alarm Inputs	1, 2, or 4 configurable, 3.3 VDC, 10 kohms, triggered; uses 6 of 16 pins on terminal block connector; supervised and unsupervised
Relay Output	1, form-C relay, 30 VDC, 1 A; uses 3 of 16 pins on terminal block connector

VIDEO ACTIVITY DETECTION

Zones	3 plus 1 background zone
Zone Types	Any shape, user-definable in 16 x 16 pixel blocks
Sensitivity/Threshold	Adjustable per zone

AUXILIARY INTERFACES

Serial	Pelco D protocols (RS-422); uses 4 of 16 pins on terminal block connector
Terminal Block Connector	16-pin: Pelco D protocols (RS-422), 4 alarm inputs, 1 relay output

FRONT PANEL INDICATORS/FUNCTIONS

Network	RJ-45, 100/1000Base-T
Power	Blue
Status	Green, amber, red
Network Link/Speed	Amber, red
Network Activity	Green
Video	Green, red

POWER

Power Consumption	Varies per number of connected channels power source
Power Input	12 VDC ±10% 24 VAC ±10% (1- and 2-channel models)
Power Connectors	
4-Pin	For RK5200PS-5U or NET5400PS; all models
PoE	1-channel models
PoE+	2-channel models

ENVIRONMENTAL

Operating Temperature	
1- and 2-channel models	32° to 113°F (0° to 45°C) at unit air intake (front of unit)
4-channel models	32° to 95°F (0° to 35°C) at unit air intake (front of unit)
Storage Temperature	–40° to 149°F (–40° to 65°C)
Operating Humidity	20% to 80%, noncondensing
Maximum Humidity Gradient	10% per hour
Operating Altitude	–50 to 10,000 ft (–16 to 3,048 m)
Operating Vibration	0.25 G at 3 to 200 Hz at a sweep rate of 0.5 octave/minute

PHYSICAL

Construction	Sheet metal
Finish	Gray metallic with black end caps, black matte finish
Dimension	8.75" D x 6.5" W x 1.2" H (22.2 x 16.5 x 3.0 cm)
Mounting	Desktop (feet), wall, or rack with options
Unit Weight	
1- and 2-channel models	2.0 lb (0.9 kg)
1- and 2-channel models	2.9 lb (1.3 kg)

STANDARDS/ORGANIZATIONS

- Pelco is a member of the MPEG-4 Industry Forum
- Pelco is a member of the Universal Plug and Play (UPnP) Forum
- Pelco is a member of the Universal Serial Bus (USB) Implementers Forum
- Pelco is a contributor to the International Standards for Organization/Electrotechnical Commission (ISO/IEC) Joint Technical Committee 1 (JTC1), "Information Technology," Subcommittee 29, Working Group 11
- Compliance, ISO/IEC 14496 standard (also known as MPEG-4)
- Compliant with International Telecommunication Union (ITU) Recommendation G.711, "Pulse Code Modulations (PCM) of Voice Frequencies"

PRODUCT WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship **for a period of one year** after the date of shipment.

Exceptions to this warranty are as noted below:

- Five years:
  - Fiber optic products
  - Unshielded Twisted Pair (UTP) transmission products
  - CC3701H-2, CC3701H-2X, CC3751H-2, CC3651H-2X, MC3651H-2, and MC3651H-2X camera models
- Three years:
  - Pelco-designed fixed network cameras and network dome cameras with Sarix™ technology.
  - Pelco-branded fixed camera models (CCC1390H Series, C10DN Series, C10CH Series, and IP3701H Series)
  - EH1500 Series enclosures
  - Spectra® IV products (including Spectra IV IP)
  - Camclosure® Series (IS, ICS, IP) integrated camera systems
  - DX Series digital video recorders (except DX9000 Series which is covered for a period of one year), DVR5100 Series digital video recorders, Digital Sentry® Series hardware products, DVX Series digital video recorders, and NVR300 Series network video recorders
  - Endura® Series distributed network-based video products
  - Genex® Series products (multiplexers, server, and keyboard)
  - PMCL200/300/400 Series LCD monitors
  - PMCL5xx Series FHD monitors
- Two years:
  - Standard varifocal, fixed focal, and motorized zoom lenses.
  - DF5/DF8 Series fixed dome products
  - Legacy® Series integrated positioning systems
  - Spectra III™, Spectra Mini, Spectra Mini IP, Esprit®, ExSite®, and PS20 scanners, including when used in continuous motion applications.
  - Esprit Ti and TI2500 Series thermal imaging products
  - Esprit and WW5700 Series window wiper (excluding wiper blades).
  - CM6700/CM6800/CM9700 Series matrix
  - Digital Light Processing (DLP®) displays (except lamp and color wheel). The lamp and color wheel will be covered for a period of 90 days. The air filter is not covered under warranty.
  - Intelli-M® eIDC controllers
- One year:
  - Video cassette recorders (VCRs), except video heads. Video heads will be covered for a period of six months.
- Six months:
  - All pan and tilts, scanners, or preset lenses used in continuous motion applications (preset scan, tour, and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to a Pelco designated location. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental, or consequential damages (including loss of use, loss of profit, and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, sales order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product that does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

To expedite parts returned for repair or credit, please call Pelco at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair) and designated return location.

All merchandise returned for credit may be subject to a 20 percent restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid

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Green The materials used in the manufacture of this document and its components are compliant to the requirements of Directive 2002/95/EC.

This equipment contains electrical or electronic components that must be recycled properly to comply with Directive 2002/96/EC of the European Union regarding the disposal of waste electrical and electronic equipment (WEEE). Contact your local dealer for procedures for recycling this equipment.

REVISION HISTORY

Manual #	Date	Comments
C4658M	3/10	Original version.
C4658M-A	4/10	Added instructions for daisy-chaining; deleted MPEG-4 as a supported file type.
C4658M-B	5/10	Corrected the callout descriptions on Figure 11.
C4658M-C	6/10	Reformatted to fit on a smaller page size.

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